Screening of celiac disease among children with growth hormone deficiency and idiopathic short stature

Amany Kamal El-Hawary, Nanees Abdel-Badie Salem, Hossam Eldin Abdel Twab Abdel Twab, Evan Emad Badrous

Mansoura University Children Hospital, Mansoura, Egypt

Introduction

Celiac disease (CD) is an intestinal chronic inflammatory and autoimmune disease that develops as a result of interplay between genetic, immunologic, and environmental factors.

Many patients, who are referred for evaluation for short stature, show initially no identifiable abnormalities and labeled as having idiopathic short stature (ISS).

Children with growth hormone deficiency may show poor response to growth hormone (GH) replacement therapy. In both conditions, this may be due to the co-existence of CD.

So the aim of the study to determine the prevalence of CD in Egyptian children diagnosed with idiopathic short stature (ISS) and those with GHD who have showed poor response to GH replacement.

Patients and method

Study Design: (cross-sectional observational case-control study).

Subjects:

The study conducted on (60) children with ISS and (40) children with GHD with poor response to GH replacement therapy and (40) healthy age and sex-matched children taken as control group. The group of children with ISS (their height was more than -2 SD for age and sex) was including those with constitutional delay of growth and familial short stature. Children with GHD with poor response to a minimum one year of continuous therapy of growth hormone replacement.

Methods:

All groups were included irrespective of whether or not they had any other symptom suggestive of CD rather than short stature such as abdominal pain, distension, clubbing, .

all participants were subjected to detailed history taken with a special focus on :manifestation of CD, clinical examination including anthropometric measures, adult predicted height (APH), Tanner stage.

Celiac disease serological screening: was assessed by Anti-Tissue-Transglutaminase IgA assay. Human Immunoglobulin A (IgA) assay was done to exclude cases of IgA deficiency .

conclusion

Screening of CD must be done as a routine investigation in children with either ISS or GHD before start of therapy.

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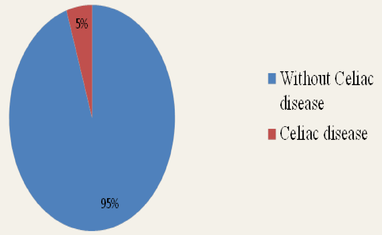
Results

Results showed that the overall prevalence of CD based on serology among ISS and GHD is the same and estimated to be 5 %. TTG Ig A titer was significantly higher in the GHD group than the ISS group and higher in both groups than control one. There were 12 cases with levels of total Ig A <20 mg/dL and were referred to perform TTG IgG serological testing but all were confirmed to be negative. All positive cases were referred to perform confirmatory upper endoscopy and histo-pathological evaluation. Children with ISS were instructed to initiate GFD while those with GHD were instructed to initiate that diet along with continuation of GH replacement therapy.

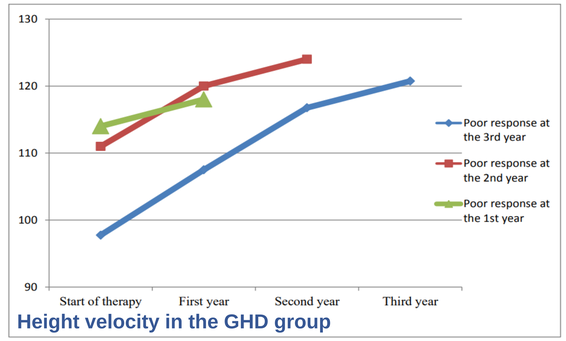
Comparison between the three studied groups according to demographic data:

	ISS (n = 60)		GHD (n = 40)		Control (n = 40)		p
	No.	%	No.	%	No.	%	
Sex							
Male	31	51.7	22	55.0	22	55.0	χ^2
Female	29	48.3	18	45.0	18	45.0	0.926
Age (year)							
Min. – Max.	3.67 – 16.67		5.0 – 16.0		4.0 – 16.0		H
Mean ± SD.	9.51 ± 3.59		10.70 ± 2.71		9.60 ± 3.51		0.204

χ^2: Chi-square test H: H for Kruskal Wallis test



Overall prevalence of CD based on serology in ISS and GHD.



Height velocity in the GHD group

Comparison between the three studied groups according to TTG Ig A and Total Ig A:

	ISS (n = 60)	GHD (n = 40)	Control (n = 40)	P
TTG Ig A (U/ml)				
Min. – Max.	(0.18 – 36.0)	(0.50 – 73.40)	(0.08 – 4.0)	$P^H < 0.001^*$
				$P1^D < 0.001^*$
Median	1.25	2.80	0.69	$P2^D < 0.001^*$
				$P3^D < 0.001^*$
Total Ig A (U/ml)				
Min. – Max.	(4.80 – 454.9)	(24.90 –160.0)	(23.0 – 194.0)	$P^H = 0.001^*$
				$P2^D < 0.001^*$
Median	40.20	118.0	61.0	$P3^D = 0.141$
				$P4^D = 0.041^*$

H: H for Kruskal Wallis test
D: D for Post Hoc Test (Dunn's for multiple comparisons test) for pairwise comparison.
p: p-value for comparing between the studied groups
p1: p-value for comparing between ISS and GHD
p2: p-value for comparing between ISS and Control
p3: p-value for comparing between GHD and Control

Descriptive analysis of TTG Ig A positive cases

Variables	First case	Second case	Third case	Fourth case	Fifth case	Mean ± SD.	
						No.	%
Sex							
Male	♀	♀	♀	♀	♂	1	20.0
Female						4	80.0
Age (year)	5.5	9	11	14	5	8.90 ± 3.78	
Group	ISS	ISS	ISS	GHD	GHD	--	
Height (cm)	100	120	127	127	95	113.80 ± 15.25	
Z-score	-2.3	-2.2	-2.4	-5.4	-3	-3.06 ± 1.34	
Weight (kg)	15	26	25	33	12	22.20 ± 8.58	
Z-score	-2	-0.65	-2.3	-3.35	-3.25	-2.32 ± 1.10	
BMI (kg/m2)	15	18	15.5	20.5	13.2	16.44 ± 2.84	
Z-score	-0.1	0.7	-0.9	0.2	-2.4	-0.50 ± 1.21	
PAH (cm)							
Before	152.7	153.7	147.6	140.3	161.5	151.16 ± 7.00	
After	---	---	---	141.5	160.5	151.00 ± 9.5	
Tanner staging	1	2	2	1	1	--	
Skeletal age deviation (year)	0	1	0	2	1	0.90 ± 1.02	
Symptoms of CD rather than SS	Abdominal distension	Negative	Growth retardation and abdominal pain	Growth retardation, abdominal distension, anemia and clubbing	Growth retardation	---	
TTG IgA(U/ml)	36	11.5	10.5	73	25	31.26 ± 25.80	
Ig A (U/ml)	8	6.4	6.45	93	160	54.93 ± 69.75	